"ANALYSIS OF MULTIMODAL BIOMETRIC SYSTEM FOR DIGITAL SECURE TRANSACTIONS"

SYNOPSIS

Submitted By

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1. Abstract:-

In 21 Century the economy moving vastly towards digital platform and many economic transaction becomes cashless or performing using the internet. So many platforms are developed for performing digital transactions and it has been very useful in cash-based economy to a cashless economy with tremendous benefits. However, the present digital transactions security is very weak. They provide some security digit codes that means four digit number as PIN (Personal Identification Number) used at the time of registration to authenticate the digital transaction or simply performing money transfer. Since people can easily misplace their PIN, so to overcome this we need to use more advance method to securing this digital transaction platform. Hence this research is useful for digital transactions and performing more than one human physiological features in securing this platform. The primary objective of this research is to analysis the different multimodal biometric system for securing digital transactions.

2. Introduction:-

Considering the enormity and sensitivity of digital transactions expected to be performed via internet platforms in the wake of the accelerated internet access of the modern age, that means of identification and authentication (verification) should be evolved in other to give security in digital transactions. As the transaction to electronic payment systems takes place, the stock of currency held outside the banking system which contributes a potential source of unproductive economic resources because they are not available for credit expansion is integrated into it thereby expanding the deposit base of the monetary system. E-payment or some digital transactions refer to the processes of exchanging monetary value among parties in business transactions and transmitting this value over the information and communication technology (ICT) networks. This digital transaction also refers to as application of digital means in the interaction between Government and Citizens and Government and Businesses. This digital transaction performs direct transactions without physical appearance at the bank or organization through means of electronic, interactive communication channels and other technology infrastructure. The risk carrying physical cash has been eliminated with the help of electronic payment or digital transactions. The digital transaction has a higher ability to encourage E-commerce as well as other online sector. Since people can perform and perfect their transactions through buying and paying electronically, the e-commerce will be highly sustained. The current digital transactions platform uses PIN to authenticate and validate payment from registered user. During payment, the platform will request the PIN from user and if the PIN is correct, the payment or transfer will be validated. However, there exist possibilities of misplacing PIN or PIN theft, when such happen the person’s financial details

will be at high risk. When PIN theft occurs, the payment platform will not be able to know that the correct PIN is not from the valid or right owner but will validate the transaction from the imposter. Meanwhile, this kind of problem scenario is not from the platform but from the user. Since it is possible to use biometric features which cannot be stolen from the owner for authentication and validation such will be best in securing digital transaction platform. The central objective and interest of this research is providing the road map for securing this digital transaction platform using more than one human physiological feature. Meanwhile biometric is the utilization of human physiological characteristics of differentiates an individual. It utilizes biological characteristic or behavioral features to recognize an individual. It is new way to authenticate digital transaction securely.

To ensuring protection they have been developed security on digital transactions, but such methods have precipitated into incessant cases of internet fraud and online theft. Quit recently, the issue of cyber-crime and cyber security has been in the front side. As solution to this internet security threat, biometric technology was evolved to ensure the security of all digital transactions. The technology of biometric involves the use of physical, behavioral and psychological features of individuals as means of identification and verification i.e. authentication. Sometimes the performance of biometric in digital transactions not up to mark so that researchers performed some advanced biometric techniques as like multimodal biometric on digital transactions to securing from intruders.

This research synopsis has presented analysis of different biometric techniques that means multimodal biometric architecture securing digital transaction platform. This will go a long way to assisting software developers on how best to secure digital transaction platform using multimodal biometric, which will help to accomplish maximum security in digital transaction, thereby encouraging the digital transactions in cashless economy.

3. Multimodal Biometric System:-

This combines two or more unique biometric features of the individuals for authentication. The combination of these features could be in terms of multiple snapshots of a single fingerprint, faces or palm or any combination of choice. However, "the biometric characteristics of an individual is normally a biological feature which can either be genetically implied possibly environmentally altered or feature acquired or learned over time that can be used to recognize or identify the individual"[4]. How secured a system is, usually is based on the amount of time it will take an impostor to decipher the ciphered biometric digital data streams. Multimodal biometric system, due to its high computational requirements is more robust and less prone to attack by an impostor.

"A recent study undertaken within the context of a fingerprint biometric system indicated that a blend of multiple enrollment templates or multiple fingers of a specific user can improve a fingerprint verification system with greater accuracy" [2]. While great attention has been given to the front end processes of this biometric system mode, the backend biometric server architectural framework has received limited attention especially as it concerns emerging economies.

Thus, the next section of this research lays down a framework for proper based on the combination of multiple biometric features. Using this framework, we authenticate the user for securing digital transactions. However, here, multimodal system is selected due to the fact that, the number of potential e-commerce users are expected to grow with time therefore the number of digital transaction takes place. The superiority of the multimodal biometric system considered in this research synopsis is in fact that the digital transaction securely verify whereas as the fingerprint which reveals a lot about an individual's identity is used for identification. This is most suitable and secured for the developing economy where trust barely exists. This framework is such that the actual identification takes place in the multimodal biometric system, whereas, the digital transaction which is performed by the user is securely authenticate.

4. Problem of Statement:-

The traditional authentication methods like password or PIN and sometimes user have smart card or OTP (one time password), such framework was pretty straightforward for authentication. This is so because, during the use of digital transaction, the user is expected to provide some security digit codes usually four digit number as personal identification number (PIN) used during authentication. Also people can easily copy someone PIN to commit fraud on those people financial details. PIN or some OTP authentication is vulnerable to hacking [4,5].

In order to improved security measures in many data driven applications, authentication like biometric plays important roles [6].

5. Review on Multimodal Biometric System:-

In this review of Multimodal biometric system, we are studied some research papers of recent years . The keywords we used in this review include multimodal biometric authentication system for securing digital transactions. For securing digital transactions, multimodal biometric system is applied with different multimodal as like fingerprint, face, voice, keystroke recognition, iris, aliveness detection, privacy protection and so on.

Multimodal Biometric system utilize behavioral or physiological characteristic for authentication. Multimodal biometric system is combining various biometric sources to offer high identification precision for authentication.

In He et al. (2010) [8], three biometric features were regarded in their study: fingerprint, face and finger vein. Support Vector Machines (SVM) -based score level fusion has been used. They join all the three modalities for verification. The fusion based on SVM classifier had attained higher accuracy.

Mohamad et.al [10] performed multimodal biometrics by combining the fingerprint and iris. They offered decision level fusion. A better performance and accuracy of 98% with FAR of 2%, FRR of 2% and accuracy of 98% is at-tained by using fuzzy logic for fusion. Are used. They have created a smart surveillance system in which an ear detection and recognition strategies were pre-sented. They also cleared many unsolved problems for ear recognition.

Gayatri Bokade et.al [11] combined face and palm print traits. They presented a feature level fusion system using a simple fusion algorithm. The GAR using palm images only is found to be 81.48%. The GAR using face images is found to be 88.88%. The fusion results indicate substantial in-crease in system to be 95%, FAR of 0.5%, FRR of 1.2%

Huang et al. (2013) [9] have proposed a multimodal bio-metric system based on face and ear. This system use feature level fusion, which use Sparse Representation (SR).

SR-based classification methods were used in multimodal classification phase. SR-based multimodal recognition techniques combined with Multimodal SRC with feature Weighting (MSRCW).

In this research, we will analysis the Multimodal biometric system, that means commenting its pros and cons in terms of accuracy, efficiency, usability, security and privacy for performing digital secure transactions.

6. Research Objective:-

Biometrics provide better security and more suitable than traditional approaches of human recognition. In few applications, biometrics can supplement or replace the current technology. The research objectives of this topic are given below.

1. The aim of this research is to contribute a comprehensive survey and analysis the existing biometrics techniques and new multimodal biometric techniques for securing digital transactions.

2. The second objective is that to securing the digital transactions by using multimodal biometric system and performing analysis.

3. The third objective is the multimodal biometric system for better way to assisting software developers on how best to secure digital transaction platform using multimodal biometric, which will also help to accomplish maximum security in digital transaction, thereby encouraging the digital transactions in cashless economy.

4. It will give better way to assisting software developers on how best to secure digital transaction platform using multimodal biometric system.

7. Significance / Importance of Study:-

1) In this digital world our economic transactions moving towards cash based to cashless. So many sectors are using digital transactions for better performance in their daily work. While using this digital transaction on internet platform some intruders perform fraud and online theft. Quit recently, the issue of cyber-crime and cyber security has been in the front side.

2) The findings of the study will be useful in assisting educators, users and researchers.

3) The individual technologies (Unimodal) shortcomings need to be study multi-factor (Multimodal) authentication for securing digital transaction.

4) It will improve security of digital transactions.

5) Significance of study emphasis on the overcome the online fraud.

8. Proposed Work Plan :-

	Plan
1st Year	Literature Collection
	Submission of Progress Report
	Pilot Study
	Submission of Progress Report
	Start experimental test
2nd Year	Detail Study
	Data Collection
	Compilation of data
	Preparation of Research Paper
	Submission of Progress Report
3rd Year	Preparation of Graphs
	Data Interpretation
	Final Compilation of Data
	Preparation of Research Paper and Communicating it for Publication
	Report Writing
	Submission of Final Report

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